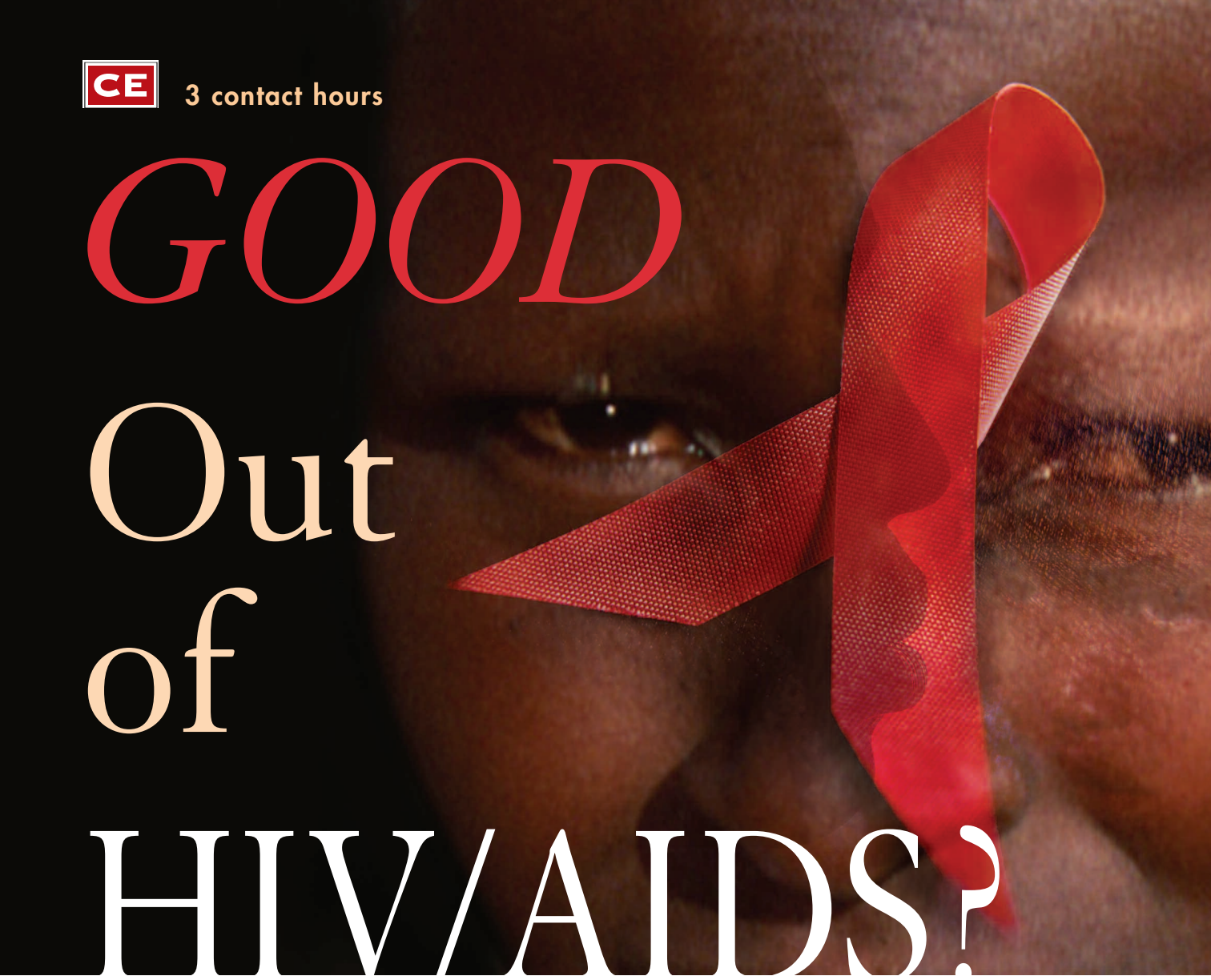
CE 3 contact hours

GOOD Out of HIV/AIDS?



Editor's note: Grace Tazelaar was on the forefront of dealing with the HIV/AIDS pandemic in the mid-1980s, before we even knew what HIV was. Her ongoing experience with HIV/AIDS has taught her difficult and invaluable lessons, lessons she shares with us.

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SINCE 1985, when I went to Uganda to serve as a missionary nurse, HIV/AIDS has had a grasp on my nursing career and life. Sent to help start a community health development program with the Christian Rural Service program of the Anglican Church, I was unaware that Uganda was incubating a pandemic that would cancel out any progress I had hoped to make in the area of community health.

Several months into my missionary nursing career, I had my first encounter with AIDS. My Ugandan colleague, a midwife, told me about her cousin, a high-ranking official in the Ministry of Foreign Affairs, who had been hospitalized in the capital city for "typhoid," which was not responding to treatment. Several days later, she was making preparations for his funeral. It was the first funeral I attended in Uganda, but certainly not the last. At that time, HIV/AIDS was unknown, and we had no idea that we were facing a fatal, incurable, devastating disease that would forever change the world. My nursing career was about to take on a new dimension, one I had not chosen.

A missionary physician named Richard Goodgame first alerted me to the AIDS problem in Uganda. He taught at the medical school at

Makerere University and practiced at Mulago Hospital, the government tertiary care facility. Dr. Goodgame offered to take me on rounds to see the situation he faced daily. War had left the hospital in terrible shape. The plumbing didn't work; there were no linens for the beds; family members cared for the physical and dietary needs of the patients; forms for hospital records were lacking; and doctors often made notes on paper provided by the family. The "wards" were rows of beds in a large, open room.

When we arrived on the unit early one Sunday morning, there were no nurses. The medical student told us there were four patients in status epilepticus. Dr. Goodgame said this was because of cerebral malaria secondary to HIV. Sadly, there was no diazepam in the hospital. In fact, many of the patients would die because there was no way to obtain medicines to treat them. Many of the patients had active tuberculosis secondary to HIV. Some patients were abandoned by their families. They had no one to cook for them and were mere skeletons. I remember thinking, *I don't know where to begin.*

By the time I returned to the United States in 1988, the gravity of the situation was apparent. In Uganda, many died daily of various infections and rare cancers. Initial surveillance reports estimated that one-third of the adult population had been infected. I was told that more than 50% of the military was HIV positive. Furthermore, entire villages had no adults between the ages of 18 and 35 years. Food was becoming scarce because people were so busy caring for the sick and burying the dead that they had no time to work in the fields.

The disease was no respecter of persons. It affected my landlord, the former chief engineer of the East African community, the peasant farmer, the director of continuing education in the Ministry of Health and the bookkeeper for the Christian Rural Service. Midwives and traditional birth attendants had higher incidences because they regularly had unprotected contact with blood and body fluids. Overcrowded schools lost teachers to AIDS. Shops closed. Coffins appeared for sale on the roadside.

COUNTERING HIV/AIDS

I began my second term in Uganda in 1988, working with the Uganda Protestant Medical Bureau (UPMB), which served all the hospitals, clinics, and health work performed by protestant churches. We collaborated closely with our counterparts in the Uganda Catholic Medical Bureau (UCMB). Together, these two church organizations provided up to 80% of the healthcare in the country. After the World Health Organization (WHO) and Ugandan Ministry of Health established the Uganda National Control Program for AIDS (UNCPA; see sidebar "Uganda and HIV/AIDS: A Success Story"), UPMB was asked to send representatives to serve on UNCPA subcommittees. I was assigned to the Patient Care and Ethics Subcommittee. The issues facing us were obtaining and allocating limited resources, setting policies for testing and confidentiality, determining standards of care for persons with HIV/AIDS, and overseeing research ethics of studies conducted in the country.

One of the first issues we had to confront was a policy regarding testing for HIV. The country had been given a limited number of enzyme-linked immunosorbant assay (ELISA) screening tests for HIV. We were responsible for determining how the tests should be used. Some healthcare workers were uncomfortable telling patients they might have AIDS without a subsequent laboratory test to confirm the diagnosis. However, the ELISA tests were expensive and limited. At the same time, a clinical definition of AIDS had been established, so others advocated using that definition for diagnosis and saving the ELISA tests for other purposes, such as testing blood transfusions. This led to a policy about when to transfuse blood.

Issues of confidentiality led our committee into long debates. For example, if a baby tested positive, that meant the mother was positive. But if we told the father, who likely infected the mother, he might abandon both the mother and the baby. Because of the complexity and far reaching implications of our policies, every policy we wrote was sent to WHO in Geneva, Switzerland, and used by other countries in their policy making.

THE CHURCH, HIV AND ABC

The now infamous ABC (*A*bstinence, *B*e faithful to your spouse, or use *C*ondoms) approach to the prevention of HIV/AIDS was born during my tenure in Uganda. The ABC approach developed from the work of the Christian churches in Uganda. The churches had been involved in an HIV/AIDS campaign before the formation of the UNCPA. The Baptists, among the first to educate the public, published a booklet, *Medical Science and God's Word Give Answers to Questions Related to AIDS,* in twelve of Uganda's major languages. The booklet told about HIV/AIDS and gave biblical answers to the disease, including a call to abstinence before marriage, presentation of the gospel message of Jesus, and encouragement to care for the sick.

@ a Glance

- **The horrors of HIV/AIDS** *began emerging in Africa in the early to mid-1980s.*
- **From the beginning,** *the Christian church in Uganda has been highly involved in offering care, education and assistance to HIV/AIDS victims.*
- **HIV/AIDS is being** *used by God to reveal profound lessons to Christians and bring people into relationship with Christ.*

Later, the Information and Education Subcommittee of the UNCPA wrote informational radio broadcasts that included a traditional drumbeat signaling danger to get public attention. They printed "Love Carefully" posters that promoted using condoms. The UCMB countered with "Love Faithfully" posters and campaigns that encouraged marital fidelity. The president of Uganda, Yoweri Museveni, promoted marital fidelity through his "Zero Grazing" campaign, a means of animal husbandry commonly understood to mean "don't wander."

No one set out to make ABC a strategy for HIV/AIDS in Uganda, let alone to have it promoted as *the* definitive approach to prevention of HIV/AIDS around the world. Yet it continues to be discussed in the literature as the reason for Uganda's widespread success in decreasing HIV/AIDS when the disease was rising rapidly all over the world, especially in other African nations.

Sadly, the ABC approach has come under attack by those who criticize the promotion of abstinence and faithfulness as having a Christian agenda and jeopardizing health by denying condoms. Critics argue that abstinence and faithfulness are not possible for persons in powerless or impoverished situations, and they criticize anyone who tries to promote such ideas.

In fact they are correct. The first booklet that we distributed throughout Uganda acknowledges that objection and answers it by quoting Romans 7:15: "I do not understand what I do. For what I want to do I do not do, but what I hate I do." The Apostle Paul goes on in Romans 8:9: "You, however, are controlled not by the sinful nature but by the Spirit, if the Spirit of God lives in you" (NIV). This is the message we taught in Uganda: To practice abstinence and faithfulness, we need God's help. That help is available to all who put their trust in Jesus Christ and receive the Holy Spirit. To work, ABC needs the good news of the gospel. God in his love and mercy poured out his Spirit in Uganda to overcome sexual sin. Our critics are correct; no one can live a holy life apart from Jesus Christ, and that is a Christian agenda.

LESSONS FROM HIV/AIDS

The devastating nature of the epidemic in Uganda, the severely limited resources, and my inadequacies often had me crying out to the Lord. The problem of HIV/AIDS was larger than I could comprehend and way too big for me. As the tragedy of AIDS unfolded, I asked God to remind me that the statistics represented people created in his image, people he loved and cared about. I prayed that God would keep me from becoming insensitive when so many were infected, ill, and suffering.

He faithfully answered my cries for help. Nearly 20 years have passed, and God continues to teach this reluctant pilgrim about himself, his Church, and his purposes through the HIV/AIDS pandemic. These are some the lessons that I have learned.

The injustices of disparity are real.

The disparity between the wealth of the developed world and the poverty of developing and undeveloped societies is exacerbated by HIV/AIDS. When I returned from Uganda in 1991, I learned that talking about HIV/AIDS was not acceptable conversation—no one wanted to hear about the health crisis in Africa—so I put HIV/AIDS on the shelf for the next 10 years. It was easy for the North American Church to believe that HIV/AIDS was punishment for a sinful lifestyle, or that Africa did not bear any political or economic consequence to our lives, and therefore did not merit significant attention or discourse.

It grieved my soul to know that people in Uganda were dying in agony without the benefit of an aspirin for pain. When we presented our list of basic comfort pharmaceuticals to a UPMB donor, he questioned our inclusion of ketoconazole (an antifungal drug) for oral thrush as too expensive and struck it from his list. He did this despite our explanations that we often had seen an AIDS patient's nutrition improve after treatment for the thrush, even resulting in the patient's return to meaningful work to provide for the family. Meanwhile, AIDS activists in the United States demanded that expensive antiretroviral drugs be provided for HIV/AIDS patients as a human right. As deaths from HIV/AIDS dropped in the United States, deaths escalated astronomically in Africa.

In 2005, there were approximately 3 million deaths from AIDS and 5 million new HIV infections around the world. Only 1% of persons infected with HIV/AIDS (300,000) were saved through treatment, and

nearly all of those lived in wealthy, developed countries (Kannabus & Fredriksson, 2006).

Think "Kingdom stewardship." I'm grateful that the Church in North America is awakening to the HIV/AIDS crisis, which affects us as members of a global community. The way we care for those in Africa and other parts of the world, such as Asia and Southeast Asia, where the disease is on the rise among the poor, widowed, and orphaned, reflects whether we share God's concern or not. God has richly blessed us and entrusted us with his resources for his Kingdom-building purposes. It's not a matter of tithing 10% and keeping 90% for ourselves. As Christians, all we have and are belong to God. We are to be stewards of those resources, for they do not belong to us.

There are good ways (and some less than good ways) of stewarding God's resources. The most common way for North Americans to address issues of poverty has been to contribute money. Finances do make a difference, but money is not always the best solution or what is most needed. We need to work together with our African brothers and sisters who have been affected by HIV/AIDS.

I recall a discussion about orphanages in Uganda and the best way to care for orphans. The African proverb that "it takes a village to raise a child" is still true, and orphans traditionally were incorporated into extended families instead of being placed in orphanages. One Ugandan commented that he had never been in a family in which all 8-year-olds slept in one room and all 10-year-olds in another. Ugandan families are intergenerational. History, values and skills are passed from one generation to the next. Planning the care of orphans in Uganda has taken this into consideration. If possible, assistance is given to the extended families to care for orphans instead of placing them in orphanages.

When I left Uganda, the Ugandans were experimenting with orphanages based on the village model, in which several children of different ages lived with caregivers in homes in an orphan village. The children were taught life skills and expected to contribute to the community and village. As North Americans, we need to listen to our African brothers and sisters, learn from the wisdom that God has given them and work together as equal partners. When we do this, we build Christ's Church.

Let Scripture be your guide. A key lesson I learned was to not compromise biblical truth out of sensitivity to cultural practices. A common criticism of mission work is that in the process of bringing the gospel to other cultures, missionaries confuse Christianity with their own cultural practices. I was trying

Uganda and HIV/AIDS: A Success Story

Understanding the horror of the HIV/AIDS pandemic in Uganda requires an appreciation of Uganda's long history of brutality, dictatorships, civil war, and military-run governments. Uganda was a British protectorate until its independence in 1962. In 1971, Idi Amin overturned the first presidency of Milton Obote. A brutal dictator, Amin was responsible for the deaths of some 300,000 people. Amin ruled Uganda until 1979. After several short presidencies, Milton Obote was returned to power in 1980. His attempt to retain his second presidency cost an additional 100,000 lives. In 1985, President Obote was ousted by Okello, an army commander, whose brief presidency was opposed and overturned in 1986 by the current President, Yoweri Museveni. Currently, Uganda remains subject to armed fighting among hostile ethnic groups, rebels, armed gangs, militias, and various government forces (Central Intelligence Agency [CIA], 2006).

While civil war in Uganda was taking place from 1979 to 1986, the HIV/AIDS epidemic also was expanding. In 1981, as HIV/AIDS was emerging in the United States, healthcare workers in Uganda began seeing a wasting disease they called "slim" (Kanabus & Fredriksson, 2006).

In 1986, as Yoweri Museveni was becoming President of Uganda, it is estimated that nearly one-third of the Ugandan adult population was infected with HIV. Museveni, the first African leader to do so, invited the World Health Organization (WHO) to work with the Ugandan Ministry of Health (MOH). Together, WHO and the MOH set up The Uganda National Control Program for AIDS (UNCPA) (Kanabus & Fredriksson, 2006). The Ugandan Protestant Medical Bureau (UPMB) and the Uganda Catholic Medical Bureau (UCMB) provided much of the support and implementation of UNCPA initiatives.

In the late 1980s, the ABC (*A*bstinence, *B*e faithful to your spouse, or use *C*ondoms) approach to preventing HIV/AIDS was created by the churches and implemented throughout the country. The impact of ABC, along with MOH initiatives and the training of health workers was incredible. In 1992, it was estimated that 30% of the people in Kampala, the Ugandan capital, were HIV positive. By 1999, that figure had been reduced to 12%. Nationwide, it is estimated that 820,000 adults and children were living with HIV/AIDS at the end of 1999 (Kanabus & Fredriksson, 2006). This figure dropped to 530,000 by 2001, and the HIV/AIDS prevalence rate dropped to 4.1% by 2003 (CIA, 2006).

Although HIV/AIDS was on the rise throughout Africa and the rest of the world, a 2004 study found that the HIV prevalence rate in Uganda had been reduced by 70% since the early 1990s (Pilcher, 2004). It is believed that this reduction in HIV prevalence was attributable to effective prevention efforts in local communities, which included promotion of abstinence and marriage fidelity and people limiting the number of their sexual partners.

In recent years, HIV prevalence in Uganda has failed to decline further, and is thought to have increased slightly. A 2004–2005 national survey showed an increase in casual sex and sexual partners (Ministry of Health, 2006). The HIV/AIDS epidemic remains severe, and the gains achieved through the 1980s and 1990s are being lost. The Christian Church in Uganda continues to play a major role in HIV/AIDS work.— **GT**

Does *ABC* Work?

The ABC (*A*bstinence, *B*e faithful, or use *C*ondoms) approach to preventing sexual transmission of HIV/AIDS was developed in the mid-1980s in Uganda to combat the growing and widespread AIDS epidemic. The program was highly effective, decreasing the prevalence of HIV from 15% in 1991 to 5% in 2001. Since that time, ABC has been adopted as the definitive approach to HIV/AIDS prevention in the general population by programs such as the U.S. Agency for International Development (USAID) and the 2003 President's Emergency Plan for AIDS Relief (PEPFAR), the largest AIDS relief plan in the history of the pandemic (Christian Connections for International Health [CCIH], 2006).

The ABC approach has been widely misunderstood, especially the A and B components, which focus on *risk elimination* for HIV transmission. In contrast, the C component focuses on *risk reduction*. A statement released in 2004 by *The Lancet* and endorsed by 150 public health experts clarifies that all three components are needed. Emphasis on the individual elements should vary on the basis of the population in question. Within the general population, youth should be encouraged to abstain, and mutual fidelity should be promoted among adults, whereas condom use should be promoted among high-risk groups (sex workers, regular multiple partners, intravenous drug users) (Halperin, Steiner, Cassell, Green, Hearst, et al., 2004).

Does the ABC approach work? Studies have shown that promoting abstinence and faithfulness among the general population of youth and adults is effective in decreasing the epidemic rate of HIV infection. Conversely, promotion of condom use alone is not effective in lowering infection rates among the general population. Findings have shown that condoms are 80% to 90% effective in preventing transmission of HIV, *when they are used consistently and correctly*. But research shows that only people in high-risk groups use condoms consistently and correctly. Furthermore, research demonstrates that inconsistent condom use is no better in preventing HIV transmission than not using condoms at all. Thus, condoms are primarily effective in preventing HIV/AIDS among high-risk groups, not among the general population (CCIH, 2006).

Proponents of ABC acknowledge that factors such as poverty, gender inequity, and social and political instability have an impact on sexual behavior. Interestingly, the ABC approach has seen its greatest success in populations with a high degree of these factors, such as those in Uganda and other sub-Saharan African nations. Supporters of ABC advocate an ABC *plus* approach. That is, they stress individual responsibility and behavior together with a simultaneous effort to have an impact on larger contextual factors such as poverty, violence, and the advancement of women (CCIH, 2006).— **JCN**

Christian Connections for International Health (CCHI). (2006). *The ABC approach to preventing the sexual transmission of HIV: Common questions and answers.* Retrieved September 11, 2006 at http://www.ccih.org/.

Halperin, D. T., Steiner, M. J., & Cassell, M. M., Green, E.C., Hearst, N., Kirby, D., et al. (2004). The time has come for common ground on preventing sexual transmission of HIV. *The Lancet, 362,* 1913–1915.

to be appropriately sensitive to Ugandan culture when planning prevention strategies. However, in trying to be culturally sensitive, I ended up, in a sense, "worshiping" culture.

Many Ugandan cultural practices contributed to the spread of HIV/AIDS. Practices such as scarification (cutting the face to leave distinctive scars of tribal markings), wife inheritance (a practice whereby the brother of a deceased man takes his sister-in-law as his wife), and circumcision contributed to the spread of HIV/AIDS. How could I teach people to do these things differently or not to do them at all to stop the spread of HIV? Discerning which cultural practices were in agreement with biblical teaching and which were not was at times a challenge that led me to a careful study of the Scripture.

God reveals himself in culture. In my quandary about the cultural aspects of a sexually transmitted disease, I was blessed by a pastoral visit from a counselor to beleaguered missionaries. He helped me see that culture was a gift of God, but that it should not usurp God's place in our programming. I now realize that God has revealed himself in all cultures. One blessing of working in a different culture is that I can experience additional dimensions of God in ways that he has revealed in other cultures. However, sin also has entered other cultures, perverting them. The challenge is to determine what is good within the culture and worthy of keeping and what is evil and needs to be discarded. My counselor wisely led me back to Scripture to see what the Bible had to teach about gender, sex, creation, marriage, sin, the fall, and redemption. Returning to Genesis 1 and 2, I appreciated that God created man and woman in his image, that he intended for one man and one woman to experience the joy of sex and the creativity of reproduction in the context of marriage, that sin had damaged that relationship, and that Jesus had come to restore marriage to its original created intent.

We can learn a lot about God and what he values from other cultures. I learned about the value of community from my Ugandan brothers and sisters. They value their relationships with their family members, their extended family members, their church families and their neighbors. Food is always shared; assistance is always rendered if within their capacity; older children, aunts, and uncles pay school fees for the young ones; property is held in common. Our North American culture could take some lessons from Africa. Our emphasis on the individual and self-reliance detracts from God-intended community in which people work together using their God-given abilities for the common good.

It's not about me. Inevitably, the ever present "Why?" questions come to the foreground. Why does God allow the already poor to suffer more with HIV/AIDS? Why did God bring me to

Uganda at this time? Why am I so helpless in this situation? There are no ready answers—just more leaning on God to learn more about who he is.

When Harvard researcher, Edward C. Green, PhD, conducted a study on what was working in the HIV/AIDS campaign in sub-Saharan Africa, he found that Uganda was one of the few countries that made progress in decreasing the incidence of HIV/AIDS. He attributed the decrease to several factors including the churches' involvement and promotion of abstinence and faithfulness in marriage (Green, 2003). I must confess that I was quite impressed initially with myself, the work that my colleagues and I had done in the early days and the amazing results that Dr. Green reported. However, in looking at my own contribution, I had to admit I had done very little. There were many others who had provided leadership for the work that was done. I had followed and implemented. I found it intriguing that very few of those leaders were currently involved in the work in Uganda or speaking on the subject. I wondered why.

Over time, the Lord made it clear to me that success belonged to him. In truth, I think we all were overwhelmed. We had each sought the Lord's guidance, and he had given each of us a part to play. No one person or group could claim ownership of the success that God had brought. I eventually figured out that it's not about me, HIV/AIDS or the work to address the pandemic. It's all about God. Any work we do for God should bring glory to him and him alone.

HIV/AIDS strikes at intimacy with God. I find it fascinating that God has chosen to use the marital relationship of a bridegroom and a bride to communicate Jesus' relationship with the church (Ephesians 5:25-33). The intimacy and sacredness of marriage is a holy mystery. Destroying, perverting, altering, and interfering with sex and the marital relationship are ways that the devil seeks to thwart God's plans for intimacy with us. Promiscuity, fornication, infidelity, adultery, incest, homosexuality, sexual abuse, pornography, and all the perversions of sex in society today interfere with and warp our understanding of God and his relationship with the Church. My understanding of spiritual warfare now includes an awareness of the place that sexual bondage has in the heavenly battles for our souls.

If we told the father, who likely infected the mother, he might abandon both the mother and the baby.

Given this understanding, it makes perfect sense to me that Satan would use the wonderful gift of sex to bring horrible sickness and destruction. Clearly, HIV/AIDS eats at the very heart of intimacy, mocking God and his relationship with us through Jesus Christ.

HIV/AIDS creates widows and orphans. The HIV/AIDS pandemic has a negative impact on economies and increases poverty, leaving women as widows and children as orphans. The Bible is replete with references to God's heart for the poor, the widow and the orphan, and to their special place among his people (Exodus 22:22-24; Deuteronomy 10:18; Psalm 146:9; James 1:27). So, once again, Satan attacks what is important to God. However, by caring for those affected by HIV/AIDS, we can learn how God values the poor, the widow and the orphan.

God values women. Several years ago, my friend and colleague, Dan Fountain MD, MPH, made a challenging statement at the Global Missions Health Conference preconference on The Church and HIV/AIDS. The Christian worldview, he said, had the answer to the HIV/AIDS crisis because it was the only religious worldview that values women. Other religions and their societies do not value women, and this contributes to the powerlessness and abuse of women as well as the increase in HIV/AIDS infection rates.

This challenging suggestion has great implications for the Christian Church. The place of women in the life of the church has been the subject of considerable debate between *egalitarians,* who believe women have equal status with men, and *complementarians*, who believe in the headship of man and woman as a complement to that role. *Feminists* have criticized the Christian church for its misuse of power against women, and for encouraging men to abuse women physically, emotionally, and sexually. Could it be that the HIV/AIDS pandemic has something to teach the Church regarding women and gender reconciliation?

God uses HIV/AIDS. God is redeeming the evil of HIV/AIDS for his purposes. As HIV/AIDS patients came to the hospital, many were presented with the good news of Jesus for the first time. They received the hope of eternal life even as they faced death. One of my patients even thanked God for the disease saying, "If I hadn't gotten sick, I wouldn't have

heard about Jesus and how he saved me." That statement gives new meaning to Romans 8:28: "And we know that in all things God works for the good of those who love him, who have been called according to his purpose" (NIV). God is able to take the evil things in this world, things that Satan means for harm, and use them for his purposes. He did that on the cross with the horrid death of Jesus. The most unjust evil act of all time, the crucifixion of God's holy Son, was the means God used to establish a relationship between himself and sinful, wretched me. His power, his wisdom, and his love are overwhelming. He is able to do immeasurably more than all we ask or imagine.

This is the God I serve—the God who has redeemed the world to himself. It is my belief in this God, the God who is redeeming the world to himself, that allows me to see value in the HIV/AIDS pandemic. Each life lost is significant; each life reflects a person made in the image of God. I pray that God will give us his heart for those in need and show us the ways that he would have us serve them.

WEB RESOURCES

- Christian Connections for International Health (2006): www.ccih.org/
- Avert, an International AIDS Charity: http://www.avert.org/

Central Intelligence Agency. (2006). *The world factbook: Uganda*. Retrieved August 29, 2006 at https://www.cia.gov/cia/publications/factbook/geos/ug.html.

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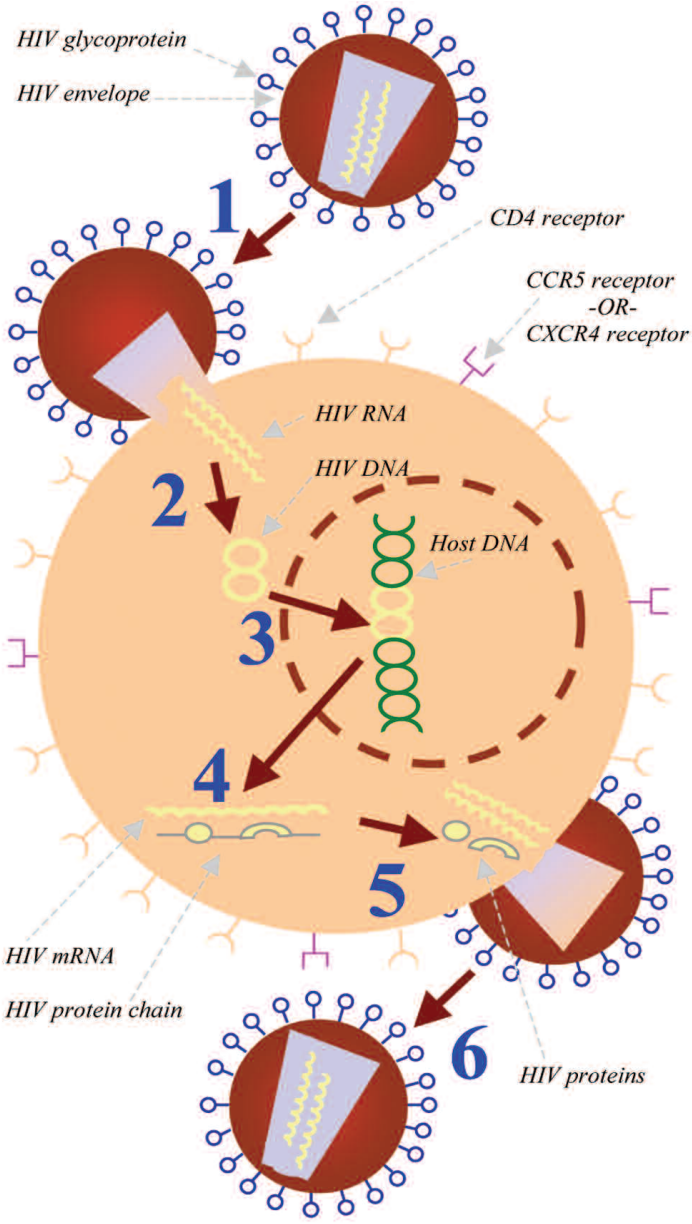
A Primer

A *JCN* Resource Article



WHAT IS HIV?

The human immunodeficiency virus (HIV) is a *lentivirus* belonging to a group of viruses known as *retroviruses*. Because lentiviruses are such a long time in producing adverse effects, the name means "slow virus" (Kanabus, Allen, & de Boer, 2006). Retroviruses, thought to cause certain types of leukemia, are a class of viruses that store their genetic information in a single-stranded RNA molecule. Retroviruses replicate by constructing a double-stranded DNA version of their genes using a special enzyme called "reverse transcriptase." The DNA "copy" then is integrated into the host cell's own genetic material. There are two known types of HIV: HIV-1 (the most common) and HIV-2 (occurring primarily in West Africa) (AIDSinfo, 2006).

on HIV/AIDS

Findings show that HIV uses CD4 T-lymphocytes as hosts. The CD4 T-lymphocyte is a type of white blood cell and an important component of the immune system. The process of replication destroys the CD4 cells, and over time, the immune system is weakened as the CD4 cell count decreases. The acquired immune deficiency syndrome (AIDS) occurs when HIV has severely weakened the immune system. A diagnosis of AIDS is made when the CD4 count drops below 200 cells/mm^3, or when an AIDS-defining condition occurs (unusual conditions that would not normally occur in someone not infected with HIV).

The U.S. Centers for Disease Control has released a list of eighteen AIDS-defining conditions, including recurring candidiasis, salmonella septicemia and pneumonia, cytomegalovirus disease, severe herpes simplex, Kaposi's sarcoma, and pneumocytis carinii/jiroveci pneumonia (AIDSinfo, 2006).

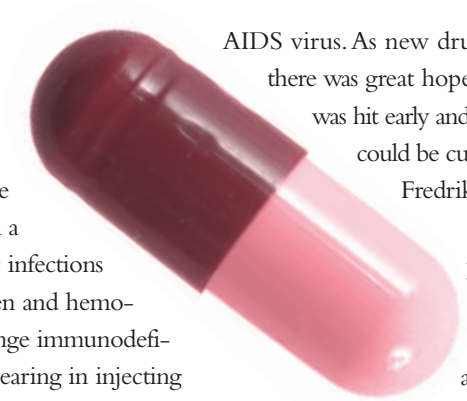
WHERE DID HIV ORIGINATE?

The origin of HIV probably will never be known. The most widely accepted scientific theory is that HIV crossed over from monkeys to humans in Africa from the butchering and consumption of monkey meat. The earliest confirmed HIV in humans was found in a plasma sample taken in 1959 from a man living in what is now the Democratic Republic of Congo. From studies of early blood samples, scientists believe HIV/AIDS was introduced among humans in the 1940s or early 1950s. Some scientists even date HIV back to the late nineteenth century. Complicated computer modeling dates the origin of HIV back to the 1930s in West Africa (Kanabus, Allen, & de Boer, 2006).

In 1981, HIV began emerging in the United States through a series of opportunistic infections and cancers in gay men and hemophiliacs. By 1982, strange immunodeficiencies also were appearing in injecting drug users and hemophiliacs. The acronym AIDS was chosen by the U.S. Centers for Disease Control because people acquired the condition instead of inheriting it, because it resulted in a deficiency within the immune system and because it was a syndrome with a number of manifestations rather than a single disease (Kanabus & Fredriksson, 2006).

By 1984, scientists in France and the United States had identified the virus causing AIDS. Dramatic optimism arose that a vaccine would be available within a few years. By that time, 7,699 AIDS cases and 3,665 AIDS deaths had been reported in the United States and 762 in Europe. Methods of casual transmission (toilet seats, saliva) were under suspicion, and fear of AIDS became rampant (Kanabus & Fredriksson, 2006).

In 1986 the virus causing AIDS was named "human immunodeficiency virus" (HIV). By the end of 1986, eighty-five countries had reported 38,401 cases of AIDS to the World Health Organization (WHO). The realization of a worldwide pandemic sparked calls for the development of a vaccine against HIV and drugs to treat those already infected. Clinical tests in the 1980s showed that the drug azidothymidine (AZT), synthesized in 1964 as an anticancer drug that proved ineffective, slowed down the attack of the AIDS virus. As new drugs emerged, there was great hope that if HIV was hit early and hard, the virus could be cured (Kanabus & Fredriksson, 2006).



A relentless progression of HIV/AIDS has been seen around the world since its discovery 25 years ago. In 2005, it was estimated that approximately 39 million people were living with HIV (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2006), including 5,000,000 new cases of HIV infection and 3,000,000 deaths from AIDS around the world (Kanabus & Fredriksson, 2006). Millions of innocent children have been infected through mother–child transmission, and millions more have been orphaned. The futility of science to slow down the worldwide pandemic of HIV/AIDS by creating a cure or vaccine makes the disease even more grievous.

HOW IS HIV TREATED?

Anti-HIV or antiretroviral medications are used to control the reproduction of the virus and slow the progression of HIV-related disease. Highly active antiretroviral therapy (HAART), the combinations of three or more anti-HIV medications in a daily regimen, is the recommended treatment for HIV infection.

There are four classes of specific anti-HIV medications, along with a class of combination therapies.

DRUG CLASS:	HOW THE DRUGS WORK:
Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)	Bind to and disable HIV-1's reverse transcriptase inhibitor, halting replication of HIV. NNRTI's are only effective against HIV-1
Nucleoside Analogue Reverse Transcriptase Inhibitors (NRTIs)	NRTI's are faulty versions of nucleosides which when used, dupe the RNA / DNA building system and stall reproduction of HIV's genetic material
Protease Inhibitors (PIs)	HIV's protease enzyme cuts long chains of HIV polypeptide into the smaller, active proteins used in HIV replication. PIs prevent HIV replication by disabling HIV-protease. Without HIV protease, the virus cannot make copies of itself
Fusion Inhibitors	Inhibit the fusing of HIV's outer envelope with the host cell membrane, thus preventing infection of the cell
Fixed Dose Combinations	Combine anti-HIV drugs to increase effectiveness and reduce the number of medications taken

Here's how HIV reproduces and where anti-HIV medications interrupt the replication process.

HIV REPRODUCTION PROCESS:		ANTI-HIV MEDICATION:
Step 1: *Binding and Fusion*	HIV binds to a CD4 receptor and one of two co-receptors on the surface of a CD4 T-lymphocyte. HIV fuses with the host cell, then releases its RNA	Fusion Inhibitors
Step 2: *Reverse Transcription*	An HIV enzyme called *reverse transcriptase* converts the single-stranded HIV RNA to double-stranded HIV DNA. Reverse transcriptase converts nucleosides to nucleotides, which are used to build RNA / DNA	NNRTIs NRTIs
Step 3: *Integration*	HIV DNA enters the host cell's nucleus. An HIV enzyme called *integrase* "hides" the HIV DNA within the host cell's own DNA. The integrated HIV DNA is called *provirus*. The provirus may remain inactive for several years, producing few or no new copies of HIV	
Step 4: *Transcription*	When the host cell receives a signal to become active, the provirus uses a host enzyme called RNA polymerase to create copies of the HIV genomic materials and shorter strands of RNA called messenger RNA (mRNA). mRNA is then used as a blueprint to make long chains of HIV proteins	
Step 5: *Assembly*	An HIV enzyme called protease cuts the long chains of HIV proteins into smaller individual proteins, which come together with copies of HIV's RNA genetic materials and a new virus particle is assembled	PIs
Step 6: *Budding*	The newly assembled virus pushes out or "buds" from the host cell. As the virus buds, it steals part of the cell's outer envelope which acts as a covering for the virus. The envelope is studded with protein/sugar combinations called HIV glycoproteins, which are used to bind to CD4 and co-receptors on the surface of new T-lymphocytes	

Note: The information about the HIV virus and its treatment is taken from *AIDSinfo*, a service of the U.S. Department of Health and Human Services. Retrieved September 8, 2006 at http://aidsinfo.nih.gov/other/factsheet.aspx. Adapted with permission.

WEB RESOURCES

- AIDSinfo, U.S. Dept of Health and Human Services (2006): http://aidsinfo.nih.gov/
- Centers for Disease Control: http://www.cdc.gov/hiv/
- UNAIDS, Joint United Nations Programme on HIV/AIDS: http://www.unaids.org/en/

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